

Brief Overview of Trending

Use **Statistical Process Control (SPC) control charts** to detect if significant changes are occurring in the process data, in accordance with HNF-PRO-4294.

SPC uses an average line for a fixed time interval. Do not change the average with each new data point added. Do not change the average line unless a statistically significant change occurs, then construct a new baseline average if the data stabilizes at a new average.

Use three standard deviation control limits. This is the best balance between detecting real changes, and avoiding false alarms. (Would changing the sensitivity on your household smoke detector make your house more safe?)

Apply the following rules to detect statistically significant change:

- One point outside the control limits
- Two out of Three points two standard deviations above/below average
- Four out of Five points one standard deviation above/below average
- Seven points in a row all above/below average
- Ten out of Eleven points in a row all above/below average
- Seven points in a row all increasing/decreasing.

Plot at least 25 data points on your control chart before discarding "old" historic data.

If there are no statistically significant changes in the data on the control chart, then you have a stable process. You must change the process in order to change the data results. Numerical Goals will NOT cause a process change, nor a real change in the data.

If there are statistically significant changes, determine the special causes of these changes. Apply this knowledge to reinforce positive trends, and to correct negative trends.

After making a system change, perform statistical trending using SPC to determine effectiveness of the change. A statistically significant improvement validates that the change was effective.



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Trending Home Page: <http://www.hanford.gov/safety/vpp/trend.htm>